Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supplementary Information

Elemental analysis was performed on different films and membranes to confirm the results of FTIR and SEM EDX.

Table S1. *Elemental analysis of films and membranes. Values given in mass-%.*

ETFE-*g*-P()	Graft level (%)	Conversion amination (%)	Elements	Calculated	Found
GMA	56	0	C	45.3	43.8
			H	4.6	4.3
			F	38.1	36.1
GMA(Tyr)	32	57	C	46.0	42.8
			H	4.6	4.7
			N	1.2	1.3
			F	39.7	38.1
S-*co*-VBC	68	0	C	53.9	54.5
			H	4.5	4.6
			Cl	6.0	4.0
			F	35.6	34.8
S-*co*-VBC(Tyr)	60	25	C	55.6	57.0
			H	4.7	4.9
			N	0.6	1.0
			Cl	4.3	0.6
			F	34.2	34.2
SSA-*co*-VBC(Tyr)	60	25	C	49.1	43.1
			H	4.2	4.5
			N	0.5	0.7
			S	3.3	5.8
			F	34.1	26.9
			Cl	3.3	0.6
S-*co*-GMA	36	0	C	49.1	47.6
			H	4.3	4.5
			F	43.6	46.6
S-*co*-GMA	61	0	C	54.0	53.2
			H	4.8	4.9
			F	36.9	38.9
S-*co*-GMA(Tyr)	33	31	C	49.0	46.6
			H	4.3	4.2
			N	0.23	0.40
			F	43.6	45.1
SSA-*co*-GMA(Tyr)	35	28	C	41.1	37.8
			H	3.6	4.3
			N	0.20	0.18
			F	36.0	36.5
			S	4.3	4.1
SSA-*co*-GMA(Tyr)	59	32	C	42.4	38.7

			H	3.8	4.6
			N	0.30	0.29
			F	28.1	28.9
			S	5.7	5.4
SSA-*co*-GMA(diol)	35	0	C	40.5	38.0
			H	3.5	3.9
			N	0	0
			F	36.4	36.5
			S	4.4	4.0
SSA-*co*-GMA(diol)	60	0	C	41.5	37.6
			H	3.7	3.9
			N	0	0
			F	28.6	27.9
			S	5.9	5.3

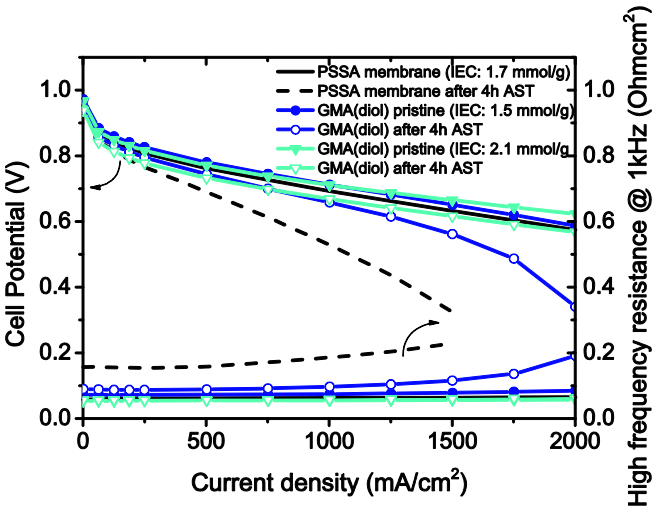

Figure S1. *Polarization curves of different radiation grafted membranes containing no antioxidant before and after accelerated stress test (AST) of 4h at OCV.*

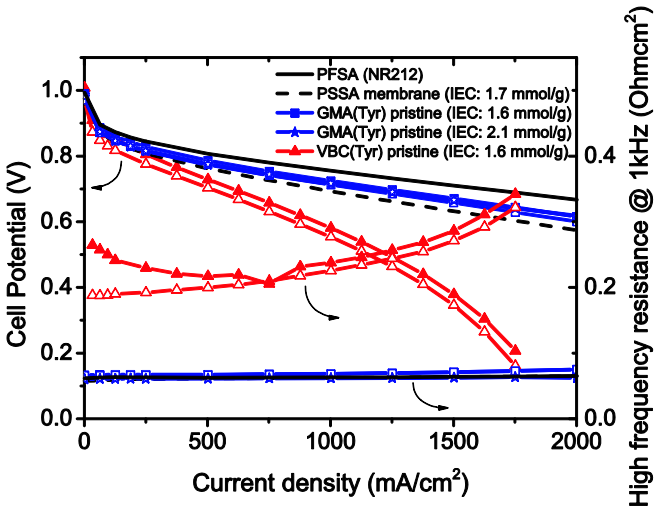

Figure S2. *Polarization curves of radiation grafted membranes with tyramine as antioxidant attached to GMA and VBC linker units before and after accelerated stress test (AST) of 4h at OCV. The curves with empty symbols represent membrane performance and HFR after 4h AST. Polarization curves and HFR of PFSA and ETFE-g-PSSA type membranes are shown for comparison.*

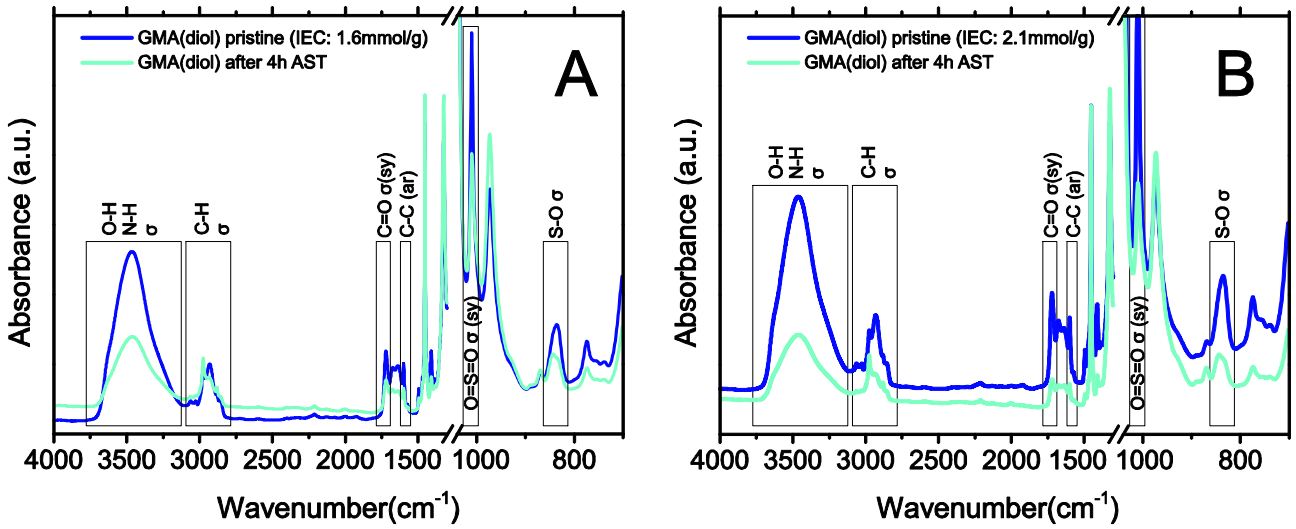

Figure S3. *FTIR spectra of GMA(diol) type membranes before and after accelerated stress test (AST) of 4h at OCV. In A, spectra of GMA(diol) type membranes of a graft level of 35% (IEC: 1.6 mmol/g) are shown, whereas in B spectra of GMA(diol) of a graft level of 55% (IEC: 2.1 mmol/g) are shown.*

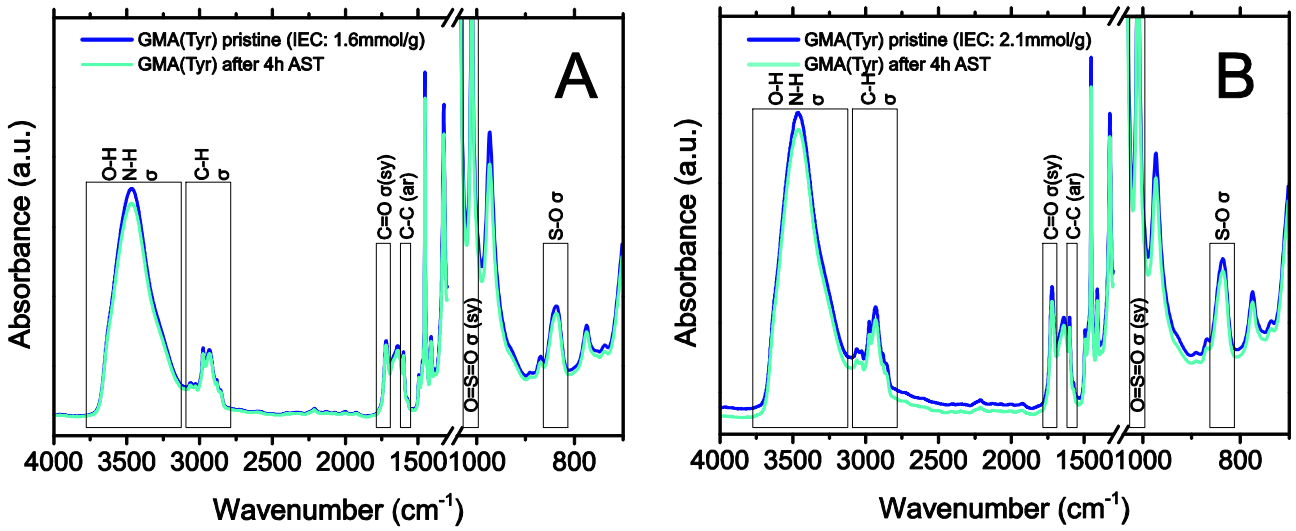

Figure S4. *FTIR spectra of GMA(Tyr) type membranes before and after accelerated stress test (AST) of 4h at OCV. In A, spectra of GMA(Tyr) type membranes of a graft level of 35% (IEC: 1.6 mmol/g) are shown, whereas in B spectra of GMA(Tyr) of a graft level of 55% (IEC: 2.1 mmol/g) are shown.*

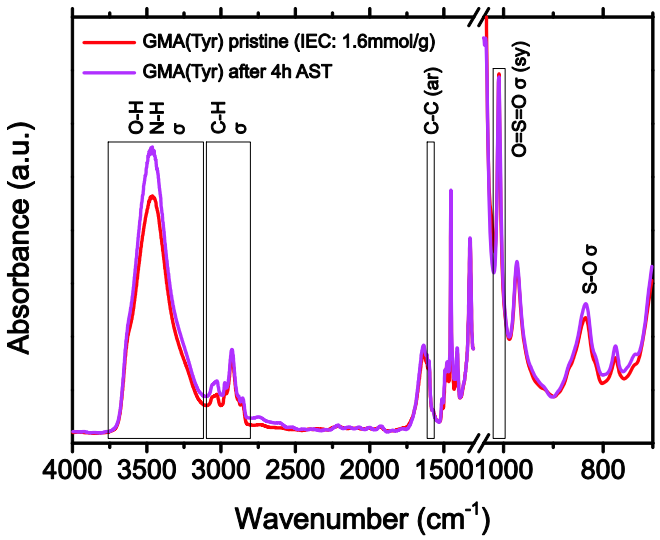

Figure S5. *FTIR spectra of VBC(Tyr) type membrane of a graft level of 67% (IEC: 1.6 mmol/g) before and after accelerated stress test (AST) of 4h at OCV.*